

Amdt. dated February 6, 2006
Reply to Office action of October 5, 2005

Serial No. 09/972,310
Docket No. SJO920010108US1
Firm No. 0037.0129

REMARKS/ARGUMENTS

The Examiner rejected claims 1-23 as anticipated (35 U.S.C. §102(b)) by Crockett (U.S. Patent No. 5,504,861). Applicants traverse for the following reasons.

Amended claim 1 recites a system for managing a network components, including storage devices and digital data processors, comprising: a first component that maintains a first representation of a topology of the storage devices and digital data processors in the network and that generates an event notification indicative of a change to the topology with respect to the network; a second component in communication with the first component, the second component maintaining a second representation of the topology and responding to the event notification by accessing the first representation; determining a discrepancy between the event notification and an attribute of any of the first and second representations; selectively disregarding the event notification or recovering the second representation from one or more attributes of the first representation in response to determining the discrepancy.

Applicants amended claim 1 to clarify certain of the claim limitations, including referring to the elements as components, adding the requirement that the representations comprise a topology of the network, that the event comprises a change to the topology, and that the second element determines the discrepancy and then selectively disregards the event notification or recovering the second representation from one or more attributes of the first representation in response to determining the discrepancy.

The Examiner cited col. 10, lines 35-53 and col. 7, lines 34-44 as teaching the requirements of these claims. (Office Action, pgs. 2-3) The cited col. 7 mentions specific sense information from the primary storage controller regarding the failure of an I/O write operation. An I/O ERP (error recovery program) may perform peer-to-peer synchronization error recovery to maintain data integrity between a primary and secondary storage controller. The cited col. 10 mentions that a primary processor transfers data and control to a secondary processor by a protocol. A data shadowing system collects control data from the primary storage controllers so that an order of all the data writes to the primary DASDs (Direct Access Storage Device) is preserved and applied to the secondary DASDs.

Nowhere does the cited Crockett anywhere disclose or mention the claim requirement of two different components maintaining first and second representations of a network topology. Further, nowhere does the cited Crockett anywhere disclose or mention that a second component

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access the first representation maintained by the first component. Instead, the cited Crockett discusses how to synchronize updates at a primary DASD to maintain the write order.

Further, the cited Crockett nowhere discloses the claim requirement that the second component accesses the first representation and determines a discrepancy between an event notification indicative of a topology change, and then selectively disregard the event notification or recover the second representation in response to the discrepancy. Instead, the cited Crockett discusses how updates to a primary DASD are copied to a secondary DASD in a manner that maintains the write order. Nowhere is there any disclosure or mention of the claim requirements of determining a discrepancy between an event notification and attributes of the first and second representations and then selectively disregarding the notification or recovering the second representation.

Applicants note that the Abstract indicates that Crockett is directed toward different art than the claims. According to the Abstract, Crockett concerns shadowing data at a remote secondary site so that updates to the primary are ordered in a consistent order. Nowhere does the Abstract or other cited sections of Crockett disclose the claim requirements of first and second components maintaining representations of a topology and the second component accessing the first representation and determining a discrepancy and selectively performing actions as claimed.

Accordingly, claim 1 is patentable over the cited art because the cited Crockett does not disclose all the claim requirements.

Claims 2-7 are patentable over the cited art because they depend from claim 1, which is patentable over the cited art for the reasons discussed above. Moreover, the following discussed claims provide further grounds of patentability over the cited art.

Applicants amended claims 2-7 to conform the preamble and changed claim elements to those changes made in claim 1, and to clarify the claim requirements.

Claim 2 recites that the network further includes a plurality of hosts, each coupled with one or more storage devices over the network; one or more agents each associated with one or more of the hosts, each agent generating a scan identifying attributes of any of (i) the host with which it is associated, (ii) one or more of the storage units to which that host is coupled, and (iii) a relationship therebetween; and wherein the agents are in communication coupling with the first component, wherein the agents transmit the scan to the first component.

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The examiner cited col. 10, lines 35-55 of Crockett as disclosing the requirements of claim 2. (Office Action, pg. 3) Applicants traverse.

As discussed the cited col. 10 discusses how updates to a primary DASD are applied to a secondary DASD to maintain the order of the data writes. The cited col. 10 discusses primary and secondary controllers and DASDs (storages) in a network. Nowhere does the cited col. 10 anywhere disclose or mention the requirements of agents generating a scan of hosts and storage units to which the host is coupled and the relationship, and that the agents transmit the scans to the first component.

Accordingly, claim 2 provides additional grounds of patentability over the cited art because the cited Crockett fails to disclose all the additional requirements of claim 2.

Amended claim 4 depends from claim 1 and further requires that the first representation comprises scans received from the one or more agents. The Examiner cited FIG. 10 of Crockett as disclosing the additional requirements of these claims. (Office Action, pg. 4) Applicants traverse.

The cited FIG. 10 shows a flow diagram of how to form consistency groups, involving time stamping I/O operations, reading captured record set information to create journal records, transmitting journal records to an SDM (system data mover), and the SDM forms consistency groups. (Crockett, FIG. 10, col. 14, line 64 to col. 15, line 35).

Nowhere does the cited FIG. 10 anywhere disclose that a first representation of a network topology comprises scans received from multiple agents. Instead, the cited FIG. 10 concerns operations to form consistency groups of updates to the primary DASD to apply to the secondary DASD.

Accordingly, claim 4 provides additional grounds of patentability over the cited art because the cited Crockett fails to disclose all the additional requirements of claim 4.

Amended claim 7 depends from claim 1 and further requires functionality that recovers the second representation by performing at least one of the following operations: i) clearing the second representation and rebuilding that representation from attributes of the first representation; ii) comparing the first and second representations in whole or in part, and copying from the first representation to the second representation attributes missing from the latter, while any of deleting or marking as missing attributes in the second representation indicative of components present in the second representation but not in the first representation;

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and iii) copying from the first representation to the second representation one or more attributes indicative of any of (a) a component or relationships represented by an attribute in connection with which the discrepancy occurred, and (b) a component or relationship in a region a component or relationships represented by an attribute in connection with which the discrepancy occurred.

The Examiner cited the above discussed cols. 7 and 10 of Crockett as disclosing the additional requirements of claim 7. (Office Action, pg. 5) Applicants traverse.

As discussed, the cited cols. 7-10 concern how to mirror updates to a primary DASD to a secondary DASD to preserve the write order. Nowhere do the cited cols. 7 and 10 anywhere disclose or mention the specific claimed functionality that recovers the second representation by performing at least one of the following operations: i) clearing the second representation and rebuilding that representation from attributes of the first representation; ii) comparing the first and second representations in whole or in part, and copying from the first representation to the second representation attributes missing from the latter, while any of deleting or marking as missing attributes in the second representation indicative of components present in the second representation but not in the first representation; and iii) copying from the first representation to the second representation one or more attributes indicative of any of (a) a component or relationships represented by an attribute in connection with which the discrepancy occurred, and (b) a component or relationship in a region a component or relationships represented by an attribute in connection with which the discrepancy occurred.

In the cited cols. 7 and 10, there is no mention or disclosure of the above discussed functionality to handle a discrepancy between an event notification concerning a change to a network topology and the first or second representations of that topology as claimed.

Accordingly, claim 7 provides additional grounds of patentability over the cited art because the cited Crockett fails to disclose all the additional requirements of claim 7.

Amended claim 8 recites a system for managing a network of components, including storage devices and digital data processors, comprising: a first component that maintains a first representation of a topology of the storage devices and digital data processors in the network and that generates an event notification indicative of a change to the topology with respect to the network; a second component in communication with the first component, the second component maintaining a second representation of the network and responding to the event notification by:

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accessing the first representation; disregarding the event notification in response to determining at least one of: i) the event notification is indicative of addition of a new component to the network and an attribute of the first representation is indicative of absence of that component; ii) the event notification is indicative of addition of a relationship between components of the network and an attribute of the first representation is indicative of absence of that relationship; iii) the event notification is indicative of addition of a relationship between components of the network and an attribute of the second representation is indicative of the absence from the network of one of the components to that relationship; iv) the event notification is indicative of a missing component of the network and an attribute of the second representation indicative of the absence of that component from the; v) the event notification is indicative of a missing component of the network and an attribute of the second representation indicates representation of that component in the second representation, but the absence of that component from the; vi) the event notification is indicative of a missing relationship between components of the network and an attribute of the second representation indicative of absence of that relationship in the second representation; or vii) the event notification is indicative of a missing relationship in the network and an attribute of the second representation indicates inclusion of that relationship in the second representation, but the absence of that component from the network.

Applicants amended claim 8 to include amendments made to claim 1 and to clarify certain limitations and elements.

The Examiner cited the same sections of Crockett cited with respect to claim 1 against claim 8. (Office Action, pgs. 6-7) Applicants traverse.

Claim 8 is patentable over the cited Crockett for the reasons discussed with respect to claim 1, because claim 8 includes many of the limitations of claim 1 that distinguish over the cited Crockett. Further, claim 8 provides additional requirements concerning when the event notification is disregarded. Applicants submit that nowhere does the cited Crockett anywhere disclose any one of the specific seven occurrences that result in disregarding an event notification on a topology change. Instead, the cited Crockett discusses copying updates to a secondary storage (DASD) to maintain a write order.

Accordingly, claim 8 is patentable over the cited art because the requirements of claim 8 are not disclosed in the cited Crockett.

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Applicants amended claim 9 to include amendments made to claim 1 and to clarify certain limitations and elements.

The Examiner cited the same sections of Crockett cited with respect to claim 1 against claim 9. (Office Action, pgs. 7-8) Applicants traverse.

Claim 9 is patentable over the cited Crockett for the reasons discussed with respect to claim 1, because claim 9 includes many of the limitations of claim 1 that distinguish over the cited Crockett. Further, claim 9 provides additional requirements concerning determining the discrepancy and selectively recovering the second representations in response to any of the listed four occurrences. Applicants submit that nowhere does the cited Crockett anywhere disclose any one of the specific occurrences that result in selectively recovering the second representation. Instead, the cited Crockett discusses copying updates to a secondary storage (DASD) to maintain a write order.

Accordingly, claim 9 is patentable over the cited art because the requirements of claim 9 are not disclosed in the cited Crockett.

Amended claim 10 includes the requirements of amended claim 1 in method format. The Examiner cited the same sections of Crockett cited with respect to claim 1 against claim 9. (Office Action, pg. 9) Applicants traverse. Claim 10 is patentable over the cited Crockett for the reasons discussed with respect to claim 1 because claim 10 includes the requirements of claim 1 in method form.

Claims 11-23 are patentable over the cited art because they depend from claim 10, which is patentable over the cited art for the reasons discussed above.

Claim 11 provides further details on the recovering operations to recover the second representation of the topology. Applicants submit that these recovery operations are not disclosed in the cited Crockett. Instead, the cited Crockett discusses copying updates to a secondary storage (DASD) to maintain a write order.

Claims 12-23 provide further details on the operations of determining the discrepancy which results in either disregarding the notification or recovering the second representation. Applicants submit that these further claimed details of determining the discrepancy in these claims is not disclosed in the cited Crockett because the cited Crockett discusses copying updates to a secondary storage (DASD) to maintain a write order, and does not disclose the claimed

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operations for determining a discrepancy between an event notification and attributes of one of the first and second representations.

Conclusion

For all the above reasons, Applicant submits that the pending claims 1-23 are patentable over the art of record. Applicants submit herewith the fee for the One Month Extension of Time. Nonetheless, should any additional fees be required, please charge Deposit Account No. 09-0466.

The attorney of record invites the Examiner to contact him at (310) 553-7977 if the Examiner believes such contact would advance the prosecution of the case.

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